3. Subbasin Assessment – Pollutant Source Inventory

3.1 Sources of Pollutants of Concern

This chapter describes the point and nonpoint pollutant sources within the Mid Snake River/Succor Creek HUC. The nonpoint source descriptions are not intended to be specific. Rather, it is a description of the general processes whereby pollutants are delivered to the water bodies of concern.

Point Sources

The only NPDES permitted sources in the watershed are the wastewater treatment plants (WWTP) in Homedale and Marsing. Table 39 shows the permit limits for these facilities. Currently, the Marsing facility discharges TSS at levels that average below 50 mg/L. Neither of these facilities contains phosphorus limits in their current permits. The Homedale facility consists of a series of ponds and sand filters followed by chlorine treatment. After treatment, the effluent discharges into a drainage ditch that flows 0.25 miles prior to discharging into the Snake River. Prior to entering the Snake River, the ditch flows through a slough, which may contribute to nutrient removal. The Marsing facility consists of a series of aerated lagoons followed by chlorine treatment.

Table 39. National Pollution Discharge Elimination System-permitted facilities in the Mid Snake River/Succor Creek Watershed.

Facility	Design Capacity (mgd)[1]	Year Plant First Went into Operation	TSS[2] Limit
City of Marsing WWTP[3] (Permit # ID0021202)	0.3	1988	70 mg/L[4]
City of Homedale WWTP(Permit # ID0020427)	0.4	1980	70 mg/L

[1]Million gallons per day
[2]Total suspended solids
[3]Wastewater treatment plant
[4]Milligrams per liter

RCRA and CERCLA Sites

There are several sites in the Mid Snake River/Succor Creek subbasin that must comply with the federal Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly called Superfund. Most of these are CERCLA sites (Table 40), which are primarily associated with pesticide storage and disposal. The US Ecology Site is the only RCRA site. It operates under a permit administered by DEQ. It is a CERCLA site as well.

Table 40. RCRA and CERCLA Sites

Facility ID	Facility Name	Public Land Survey Location
ID1141100015	USDOI BLM[1] Hulet Dump	T3S R1W Sec 15
ID2141190031	USDOI BLM Pickles Butte Airstrip	T2N R2W Sec 28
ID3141190014	USDOI BLM Pesticide Dump Murphy	T3S R1W Sec 35
ID4141190013	USDOI BLM Pesticide Dump Site, Reynolds	T3N R5W Sec 3
ID6141190011	USDOI BLM Owyhee County Marsing/Homedale Landfill	T4N R5W Sec 32
ID6141190045	USDOI BLM Dry Lakes Airstrip	T1N R1W Sec 26
ID7141190010	USDOI BLM Owyhee County Wilson Creek Landfill	T1S R3W Sec 13
IDD072981533	Owyhee County Marsing Airport	T3N R4W Sec 26
IDD980726020	Homedale ARPT Pesticide Dump Site	T3N R5W Sec 10
IDD980980247	Marsing Building Center	T3N R4W Sec 34
IDD984666784	Agriculture Supply Inc.	T2N R4W Sec 3
IDD073114654	US Ecology/Envirosafe Services of Idaho Inc. Site B	T4S R2E Sec 19

[1]U.S. Department of the Interior, Bureau of Land Management

Nonpoint Source Pollutants

This description is not intended to be specific. Rather, it is a description of the general processes whereby pollutants are delivered to the water bodies of concern. A detailed description of locations and potential sites for improvement will be located in the final implementation plan.

Phosphorus
Phosphorus is found naturally throughout the environment. It can be present as a constituent of certain rock types (silicious igneous rock) and in the mineral *apatite*. The environment itself can also be a factor in the phosphorus levels occurring within a region, due to the climate, pH of natural waters, and the presence of other substances that may adsorb or release phosphorus. However, there are also anthropogenic nutrient sources that greatly increase phosphorus levels over those found naturally. Applied fertilizers in farming or landscaping, the duration and density of livestock grazing, the creation of artificial waterways and water levels through agricultural practices, and the presence of sewage and septic waste (treated and untreated) in the surface, subsurface, and ground water of a region often represent significant contributions to the phosphorus concentrations in an area.

Nitrogen
Nitrogen occurs in the environment in a variety of sources and forms. It can be present as a mineral constituent of certain rock types; as a result of the decomposition of plant and other organic material; in rainfall; as a component of agricultural or urban/suburban runoff; and as

a constituent in treated or untreated wastewater from industrial, municipal, or septic discharges. In addition, the air is composed of about 80% nitrogen gas. Blue-green algae can use atmospheric nitrogen at the surface-water interface or the nitrogen dissolved in the water as a source of nitrogen to support growth. Since algae can use atmospheric nitrogen, reducing nitrogen in the water is not often targeted as a factor to achieve water quality improvements in water systems dominated by blue-green algae. Since reducing watershed-based sources of nitrogen is not usually a successful treatment option in these systems, total phosphorus reductions are often sought.

Sediment
The most common source of sediment in the tributaries is erosion. Sediment may originate from natural causes such as landslides, forest or brush fires, high flow events; or anthropogenic sources such as urban/suburban storm water runoff or erosion from roadways, agricultural lands, and construction sites. Sediment loads within the system are highest in the spring when high flow volumes and velocities result from snowmelt in the higher elevations.

The contribution of mass wasting to sediment loading in the Mid Snake River/Succor Creek watershed is low. While Figure 1.6 (in Chapter 1) shows areas of potentially high erosion, the majority of high erosion areas shown around the Snake River are areas of steep cliffs and aerial photo analysis showed bare ground that did not show large-scale landslide events along the river. These areas were determined using slope, wind erodibility groups, and K factor analysis.

Temperature
Increases and decreases in water temperature are due to changes in the amount of heat reaching the water. There are several factors that contribute to the amount of heat reaching the water in the Mid Snake River/Succor Creek watershed. The anthropogenic factors include agricultural return water, agricultural withdrawals, dams, and a loss of riparian vegetation (shading). Natural factors include seasonal air temperature changes, natural dams, and naturally warm springs that feed water to the stream. In addition, at times riparian vegetation has been lost both to manmade (i.e. poor grazing practices, off-road vehicle use) and natural causes (i.e. rain on snow event). Only those anthropogenic sources that are directly controllable are addressed in this TMDL.

Bacteria
Bacteria enter water bodies in a number of ways. Wastewater treatment plants and failing septic systems are the most common sources in watersheds that contain urban influences. Domestic pet waste can also be a significant source. In rural and agricultural areas the most common sources are farm and ranch animals and wildlife, although failing septic systems can also be a significant source if they are situated adjacent to a water body.

Pollutant Transport

Nutrients
Consideration of flow is important in the evaluation of nutrient, phytoplankton, periphyton, and rooted macrophyte concentrations. In a riverine system, flow transports phytoplankton

and nutrients from upstream to downstream in an advective or dispersive transport mode. In other words, the riverine system is a dynamic system in which nutrients are being continually cycled as the water moves downstream. The flow regimen is important in determining the result of this combination of component concentrations. High flows can flush dissolved constituents like nutrients downstream, replacing them with the lower concentrations in the high flows. Since nutrient concentrations are inversely related to flow, nutrient retentiveness is much lower in high flow years than in low flow years. High flows can also scour periphyton and rooted macrophytes, reducing their mass considerably. Finally, high flows can scour sediments causing movement of the sediment downstream and increasing nutrient concentrations at the same time by releasing nutrients tied up in the sediments prior to scouring (Armstrong 2001).

Sediment

While no quantitative information is available, it is recognized that a substantial amount of sediment can be generated and transported relatively long distances by extreme precipitation events, such as the 1956 flood in Reynolds Creek. It has been estimated these rare events can account for the movement of a greater volume of sediment in a single event than would be expected to occur in an entire water year under average conditions (BCC 1996). Sediment transport, and the transport and delivery of sediment-bound pollutants, are directly associated with increased flow volumes and high velocities.

Bacteria

Bacteria are primarily transported from its point of origin during precipitation and irrigation activities. Bacteria can enter surface water via movement from manured fields, problem feedlots and overgrazed pastures. Insufficient sewage management systems (septic tanks) may also transport bacteria, especially in areas where the water table is shallow and readily mixes with surface water. Bacteria may also be transported in stormwater in areas where stormwater is discharged directly to the water body.